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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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10/716,458

11/20/2003

Hiroshi Suzuki

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02/09/2005

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ALEXANDRIA, VA 22314

EXAMINER

LEYKIN, RITA

ART UNIT

PAPER NUMBER

2837

DATE MAILED: 02/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                                      |  |  |
|------------------------------|--------------------------------------|--|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/716,458 | <b>Applicant(s)</b><br>SUZUKI, HIROSHI |  |
|                              | <b>Examiner</b><br>Rita Leykin       | <b>Art Unit</b><br>2837                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2 and 5-7 is/are rejected.
- 7) ☒ Claim(s) 3, 4, 8 and 9 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>04/30/04</u> | 6) <input type="checkbox"/> Other: ____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 5, 6 and 7 are rejected under 35 U.S.C. 102(e) as being anticipated by Kitajima US # 6,768,280.

Kitajima discloses a motor control device that comprising a current control system that controls fundamental wave component of a motor current and a higher harmonic component that are contained in the orthogonal coordinate system. In the above motor control apparatus it is judged whether an output voltage from the power conversion device is in a saturated state, (see abstract). In Fig. 1 Kitajima shows:

- A torque control circuit 1 calculates current command value  $i_d^*$  for d-axis current and command value  $i_q^*$  for q-axis current by using a current command value table based upon torque command value and a motor rotation rate, (see column 5, lines 6-10). That reads on applicants inputting current command value every control cycle;
- Calculation of electric current deviation by integrating the deviation value between actual motor current value, measured via sensors 6 and 7 and

current command value obtained via table/calculated current command value, by utilizing subtractors 2a and 2b, (see column 5, lines 1-19);

- Calculation of d-axis and q-axis fundamental voltage command value to be used to reduce current deviations to 0;
- An inverter 4 that switches a dc voltage from a dc source (not shown), such as a battery based upon the 3-phase ac voltage command values  $v_u^*$ ,  $v_v^*$  and  $v_w^*$  with a switching element and generates 3-phase voltage that is applied to the motor M;
- A PWM inverter is utilized to implement drive control on AC motor. A state in which a voltage higher than the voltage that the inverter is capable of outputting needs to be applied to the motor is referred as a "voltage-saturated" state, (see column 2, lines 40-46). That reads on applicant's control means for controlling a switching timing based on voltage command;
- A voltage saturation judging means 15, (see Fig. 6 and 7 and column 9, lines 20-54).

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2, and 7 rejected under 35 U.S.C. 103(a) as being unpatentable over Kitajima US # 6,768,280 and Akao US # 5,883,484.

The limitations of the base claims 1 and 6 have been discussed in the rejection above. Kitajima does not teach a boosting circuit for boosting the power source voltage that is outputted from the power source and an inverter coupled with the boosting circuit. However Akao disclosed an intelligent power module, IPM 14 in connection with a booster 24. When the computed voltage exceeds an actual battery voltage, a booster is inserted between the battery and IPM, and the battery voltage, after being boosted, is applied, (see abstract).

Hence, it has been obvious to one of ordinary skills in the art, at the time invention was made to combine above teachings, to supply ac motor with voltage generated in accordance with the calculated load as in Kitajima and maintain voltage via boosting circuit as in Akao to provide appropriate voltage level on inverter terminals to supply the motor.

The reason is to avoid significant rise of voltage in the circuit, wherein the terminal voltage of the motor does not exceed the value corresponding to the battery voltage.

***Allowable Subject Matter***

5. Claims 3, 4,8 and 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter. The prior art made of record in the attached form PTO-892 considered to be pertinent to the submitted application. However, none of the prior art teaches or suggest the combination of claimed limitations with:

- The electric voltage command calculation means that does not perform the integration of electric current deviation for further increasing the electric current deviation integrated value at the next control cycle when the electric voltage saturation judgment means judges the electric voltage saturation.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rita Leykin whose telephone number is (571)272-2066. The examiner can normally be reached on Monday-Friday 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Martin can be reached on (571)272-2107. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Rita Leykin  
Primary Examiner  
Art Unit 2837

A handwritten signature in black ink, appearing to read "Rita Leykin", written in a cursive style.

R.L.